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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,199	08/07/2001	Parvathanathan Subrahmanya	010196	1136
23696	7590	02/07/2006	EXAMINER	
QUALCOMM, INC			HOQUE, NASRIN	
5775 MOREHOUSE DR.			ART UNIT	
SAN DIEGO, CA 92121			PAPER NUMBER	
			2631	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/924,199		SUBRAHMANYA ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Nasrin Hoque		2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☒ Claim(s) 4-6,9,14,20,25,27-28

is/are allowed.

- 6) ☒ Claim(s) 1-3,7,8,10-13,15- 19, 20-24,26,29 and 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/07/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

1. Claims 1-30 are pending in this application.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 19 are rejected under 35 U.S.C. 102(e) as being anticipated Stirling-Gallacher et al. (Pub #:2002/0001352).

- Regarding claim 1, Stirling-Gallachcher discloses that a channel estimation means at a receiving device for data symbols based on received pilot symbols and filter selection means which selects the filter for channel estimation based on interference value (Stirling-Gallachcher : Fig 4, [ 0026]); this inherently shows that that the receivers receives and process a modulated signal for a pilot included in the modulated signal. The above functionalities are equivalent to receiving and processing a modulated signal at the receiver unit to derive received pilot symbols for a pilot included in the modulated signal, estimating one or more characteristics of the communication channel based on the received pilot

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symbols; and filtering the received pilot symbols in accordance with a particular filtered response to provide filtered pilot symbols that comprise the pilot estimate so that the particular filter response is selected from among a plurality possible filter responses based on the one or more estimated channel characteristics per claimed.

- Regarding claim 19, which further specifies a communication channel between a base station and a terminal in addition to all limitations of claim 1, Stirling-Gallachcher discloses that a communication channel is being supported between a base station and a mobile station (Stirling-Gallachcher : Fig 1, [ 0002]) which by definition in the art/industry is known as forward /down link.

### **Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. in view of in view of Perets (Pub #: 2003/0003889).

Regarding claim 2 which inherits limitations of claim 1, Stirling-Gallachcher discloses all as applicable to claim 1; however Stirling-Gallachcher does not explicitly disclose channel characteristics are indicative of noise.

Perets discloses that a received signal is being processed through a noise estimation and noise spectrum to determine the class of noise (Perets : Fig 1, [0011] ) which is equivalent of estimated channel characteristics are indicative to noise per claimed .

Therefore it would been obvious to a person of ordinary skill in the art that selection of a filter from plurality of filters provides flexibility to compensate error (for example noise spectrum etc.) for received signals.

6. Claim 3 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. in view of in view of Eran et al. (Patent #: 6,862,326).

Regarding claim 3 which inherits limitations of claim 1, Stirling-Gallachcher discloses all as applicable to claim 1; however Stirling-Gallachcher does not explicitly disclose channel characteristics are indicative of fading.

Eran discloses that messages including the training sequence are effected by channels characterized by fading (Eran : column 2, lines 64-65) which is equivalent of channel characteristics are indicative to fading per claimed . Therefore it would been obvious to a person of ordinary skill in the art that implementation of efficient method to eliminate the channel characteristics like noise, fading etc.) will result in effective communication system.

7. Claims 7, 10 are rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. in view of Hunzinger (Patent #: 6,834,194).

Regarding claim 7 which inherits limitations of claim 1, Stirling-Gallachcher discloses all as applicable to claim 1; however Stirling-Gallachcher does not disclose predicted pilot, predicted error between predicted pilot and received symbols and selecting particular response.

Hunzinger discloses that pilot strength is being predicted, pilot strength expectation is followed by bias sector indicative unit which is equivalent of prediction error determination, and selection of serving selector (Hunzinger : Fig 6, blocks 600,604, 604, Lines 42-67, column 14, lines 22-24); since block 610 describes selection of best sector, it inherently appears that plurality of units is being supported. Therefore it would be obvious to a person of ordinary skill in the art that selection of any operating unit from plurality of units provides flexibility for service providers and error correction accordingly.

- Regarding claim 10 (which inherited limitations of claim 7), Perets further discloses that a channel estimation unit can be used to determine the impulse response prior to received signal which is equivalent of prediction error and this value can be used to compare the noise power levels which are equivalent of thresholds for selecting a filter from a bank of filters per claimed (Perets : Fig 1, [0011], [0012], [0017])

8. Claim 8 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. , Hunzinger and further in view of Masaki (Patent #: 6,356,309).

Regarding claim 8 which inherits limitations of claim 8, Stirling-Gallachcher and Hunzinger disclose all as applicable to claim 7, however does not disclose prediction error. Masaki discloses that prediction error (Masaki : column 1, lines 65-67 and column 2 lines 1-3); Masaki further discloses communication system supports prediction error (Masaki : column 75, lines 45-52); since predict error is determined from communication channel it is inherent that prediction error includes periodical errors and selection is performed accordingly. Therefore it would be obvious to a person of ordinary skill in the art support of constant or burst/periodic errors allows to suppress /adjust allowing display of a moving picture with smooth motion.

9. Claims 11 and 17 are rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. in view of Jakobsson (Patent #: 6,977,978).

Regarding claim 11 which inherits limitations of claim 1, Stirling-Gallachcher discloses all as applicable to claim 1, however Stirling-Gallachcher does not disclose plurality of possible filter responses are associated with different bandwidths & plurality sets of coefficients are being supported. Jakobsson discloses a plurality of filter coefficients are associated with bandwidths (Jakobsson : column 11, lines 24-27). Therefore it would have been obvious to a person of ordinary skill in the art that implementation of bank of

plurality of filters with different bandwidths provides the flexibility to adjust co-channel and adjacent channel rejection performance.

10. Claim 12 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher, Jakobsson et al. and further in view of Case et al. (Patent #: 6,463,405). Regarding claim 12 which inherits limitations of claim 11, Stirling-Gallachcher & Jakobsson discloses all as applicable to claim 11, however Stirling-Gallachcher does not disclose relationship of narrow bandwidth with noise. Case discloses that short band noise can be supported which is equivalent to narrow bandwidth (Case: column 6, lines 18-19). Therefore it would have been obvious to a person of ordinary skill in the art that implementation narrow band will allow to develop products which will encode digital audio signals with a very large dynamic range.

11. Claim 13 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher, Jakobsson et al. and further in view of Khullar et al. (Patent #: 6,904,104). Regarding claim 13 which inherits limitations of claim 11, Stirling-Gallachcher & Jakobsson discloses all as applicable to claim 1, however Stirling-Gallachcher does not disclose relationship of narrow bandwidth with low fading. Khullar discloses that fading relatively in narrow bandwidth (Khullar : column 2, lines 50-52) which is equivalent to narrow bandwidth for fading per claimed. Therefore it would have been obvious to a person of ordinary skill in the art that implementation of



modulation technique (i.e. demod at receiver) would allow to immune to amplify any channel characteristics.

12. Claims 15-16, 21, 23 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et. al. (Patent #: 6,160,673) in view of Leung (Patent #: 6,671,268).

- Regarding claim 23, Stirling-Gallachcher discloses that a channel estimation means at a receiving device for data symbols based on received pilot symbols and filter selection means which selects the filter for channel estimation based on interference value (Stirling-Gallachcher : Fig 4, [ 0026]); this inherently shows that that the receivers receives and process a modulated signal for a pilot included in the modulated signal per claimed for first two items.

Stirling-Gallachcher does not explicitly disclose prediction errors for each filter response based on the received pilot symbols and the filtered pilot symbols derived from the filter response and filter response associated with prediction errors.

Leung discloses that prediction error can be derived based on received pilot signal (Leung : Fig 3, blocks 214, 306, 310, column 5, lines 48-55 and Fig 4 ) and filtered pilot symbols are derived from the filter response (Leung : Fig 3, blocks 216, 312, column 5, lines 48-55 and Fig 4, column 6, lines 38-53); it is evident that via design choice minimum prediction errors as the pilot estimates can be used for filtered pilot symbols.

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These are equivalent of deriving prediction errors for each filter response based on the received pilot symbols and the filtered pilot symbols derived from the filter response and providing the filtered pilot symbols derived from the filter response associated with minimum prediction errors as the pilot estimates (last two items) per claimed. Therefore it would be obvious to a person of ordinary skill in the art that by using the predictive channel estimates the channel condition may be estimated more accurate resulting in better error handling condition.

- Regarding claims 15-16 (which inherit limitations of claim 1), Leung further discloses that pilot filter may be a FIR or IIR (Leung : Fig 3, block 216, , column 5, lines 37-38).
- Regarding claim 21 which inherits limitations of claim 19, Stirling-Gallachcher explains all as applicable to claim 19, however Stirling-Gallachcher does not disclose filtered pilot symbols derived from prediction errors and received pilot signals. Leung discloses that prediction error can be derived based on received pilot signal (Leung : Fig 3, blocks 214, 306, 310, column 5, lines 48-55 and Fig 4 ) and filtered pilot symbols are derived from the filter response (Leung : Fig 3, blocks 216, 312, column 5, lines 48-55 and Fig 4, column 6, lines 38-53);  
Therefore it would be obvious to a person of ordinary skill in the art that by using the predictive channel estimates the channel condition may be estimated more accurate resulting in better error handling condition.

13. Claim 18 is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher et al. in view of Wang (Patent #: 6,125,137). Regarding claim 18 which inherits limitations of claim 1, Stirling-Gallachcher explains all as applicable to claim 1, however Stirling-Gallachcher does not specify support of CDMA. Wang discloses IS-95 standard i.e. CDMA is being supported for one application (Wang: Column 1, line 14-15). Therefore it would be obvious to a person of ordinary skill in the art that detection of a signal in multi-path environment would be required to support different wireless standards like CDMA, OFDM etc.

14. Claim 22 (inherits limitations of claim 19) is rejected under 35 U.S.C.103 (a) as being unpatentable over Stirling-Gallachcher, in view of Khullar et al. (Patent #: 6,904,104). See Paragraph 11.

15. Claim 24 is rejected under 35 U.S.C.103 (a) as being unpatentable by Stirling-Gallachcher, Leung and further in view of Perets (Pub #: 2003/0003889). Regarding claim 24 (which inherit limitations of claim 23), Stirling-Gallachcher and Leung discloses all as applicable to claim 2; however does not disclose support of plurality of filters responses. Perets discloses that plurality of filter responses can be supported (Perets : Fig 2, blocks 34,36,[0019]). Therefore it would be obvious to a person of ordinary skill in the art that implementation of a plurality of filters allows

16. Claim 26 is rejected under 35 U.S.C.103 (a) as being unpatentable Leung in view of Perets (Pub #: 2003/0003889). Regarding claim 26, Leung discloses that a pilot filter receives a signal which inherently shows that the receivers receives and process a modulated signal for a pilot included in the modulated signal (Leung : Fig 3, block 216) and a control unit is coupled to filter and estimation unit which estimate based on received signals (Leung : Fig 3, blocks 312, 216, 310, column 5, lines 47-55 ].

Leung does not explicitly disclose to filter the received pilot symbols in accordance with a particular filter response to provide filtered pilot symbols and selection of a filter from among a plurality of possible filter responses based on the one or more estimated channel characteristics.

Perets discloses that a filter can be selected based on received signals via a switch and operative for directing to one of the filters (Perets : Fig 1, [0012], Fig 2, [0019] ).

Therefore it would been obvious to a person of ordinary skill in the art that selection of a filter from plurality of filters provides flexibility to compensate error (for example noise spectrum etc.) for received signals.

17. Claim 29 is rejected under 35 U.S.C.103 (a) as being unpatentable Leung, Perets and further in view of Jakobsson (Patent #: 6,977,978). Regarding claim 29, which inherits limitations of claim 26 , Leung, Perets discloses all as applicable to

claim 29, however Leung, Perets do not disclose plurality of possible filter responses are associated with different bandwidths. Jakobsson discloses a plurality of filter coefficients are associated with bandwidths (Jakobsson : column 11, lines 24-27). Therefore it would have been obvious to a person of ordinary skill in the art that implementation of bank of plurality of filters with different bandwidths provides the flexibility to adjust co-channel and adjacent channel rejection performance.

18. Claim 30 is rejected under 35 U.S.C.103 (a) as being unpatentable Leung, Perets in view of Wang et al. (Patent #: 6,125,137). Regarding claim 30, Leung discloses that a pilot filter receives a signal which inherently shows that that the receivers receives and process a modulated signal for a pilot included in the modulated signal (Leung : Fig 3, block 216) and a control unit is coupled to filter and estimation unit which estimate based on received signals (Leung : Fig 3, blocks 312, 216, 310, column 5, lines 47-55 ] a PN de-spreader (Leung : Fig 2/3, block 204, column 2, lines 37- 44) Perets discloses that a filter can be selected based on received signals via a switch and operative for directing to one of the filters (Perets : Fig 1, [0012], Fig 2, [0019] ).

Leung, Perets do not explicitly specify that a plurality of finger processors, despreader to provide data and pilot symbols and pilot demodulator.

Wang discloses a rake receiver with a plurality of fingers (Wang: Fig 3, blocks 350-370, column 6, lines 10-11).

Note that the claim describes that “a first and second channelizer coupled to despreaders and operative to provide data and pilot symbols” which in the light of specification has been describes to support “dispersing function [0030-0031];” based on that for those limitations Wang shows that a data desreader and a pilot desreader (Wang: Fig 3, blocks 3332, 360, column 6, lines 29 – 31) are being supported; it is inherent that data and pilot symbols will be generated. Wang further discloses that data and pilot symbols are provided for demodulated symbols (Wang: Fig 4, blocks 232, 460, 463, 454, column 7, lines 56-54). Therefore it would be obvious to a person of ordinary skill in the art that implementation of an efficient method based on multipath signal searcher allows to provide signal search capability within a wideband wireless communication to eliminate low multi-path signal detection.

### **Allowable Subject Matter**

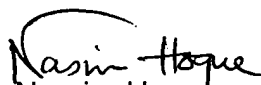
19. Claim 4-6,9, 14, 20, 25, 27-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

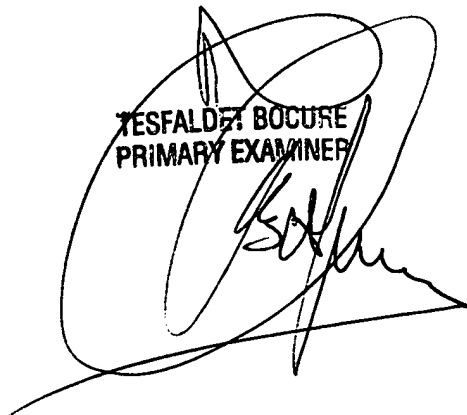
### **Conclusion**

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nasrin Hoque whose telephone number is 571-272-5948. The examiner can normally be reached on M-F from 9:00 AM – 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tesfaldet Bocure can be reached on 571-272-3015. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Nasrin Hoque  
Examiner  
Art Unit 2631

  
TESFALDET BOCURE  
PRIMARY EXAMINER